

lithographs by Messrs. West, Newman and Co. The two key-maps were prepared by Dr. Wilson and Lieut. Skelton.

The illustrations deal with most branches of the work of the expedition, and they are naturally of most importance in connection with the topography, and Dr. Wilson's outline sketches are an invaluable supplement to the maps previously issued by the expedition, and his pictures of the aurora, clouds, and earth shadows represent features for which photography is useless. The characters of the scenery are especially well shown in the long panoramas by Lieut. Skelton, some of which are reproduced as folding plates three feet long. Some of the most interesting photographs were taken by Lieut. Skelton with a telephotographic lens, and he thus brings out the general outlines of Mount Sabine (Fig. 1) from a distance at which the ordinary photograph is com-

The album is a more useful addition to the literature which has already appeared in connection with the expedition, and is to be regarded as a supplement to the works by Captain Scott and to the volumes of the scientific reports noticed already in *NATURE*, vol. lxxiii., 1905-6, pp. 297-300, two figures, and vol. lxxvii., April 16, 1908, pp. 561-2.

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AMERICAN AND CANADIAN WATERWAYS.

WHILE in this country the interest that at one time was evinced in the improvement of our canals, since the evidence that was brought before the Royal Commission, appears to have evaporated, in the United States and Canada this subject has come very much to the front. It is generally recog-



FIG. 2.—The Pressure Ridges at Cape Crozier. From a photograph taken by Lieut. R. W. Skelton, October 18, 1902; looking S.E. from the land-ice of the eastern extremity of Cape Crozier, Ross Island. From "National Antarctic Expedition, 1901-4. Album of Photographs."

paratively useless. The album includes many zoological photographs illustrating the whales, seals, and especially those most attractive of photographic subjects, the penguins.

The illustrations of the geological details are less numerous. Photographs of the glaciers are of especial value owing to the changes which take place in the distribution of the ice. There are many excellent illustrations of glacier tables, sastrugi, and icebergs; but the album would have been more useful had it contained more photographs showing the detailed intimate structure of the ice. There are several photographs of the Great Ice Barrier, but they add little to the evidence of that by Bernacchi, which was reproduced in the review in *NATURE* of Captain Scott's book. The photographs of the chasm between the Barrier and the land ice help to indicate the great difference between the rapidly moving barrier ice and the more stagnant ice along the shore.

nised that the question of transport by water is one of the most pressing needs of the country. During the last few years the home commerce has grown at such a rapid rate that the railways appear to be utterly unable to cope with it efficiently. During the past seven years, while trade has doubled in quantity, the railway facilities for transporting this have only increased one-fourth. It is generally acknowledged that it will be a wise policy on the part of the Government to spend as much money as will be available in improving the internal waterways and in constructing links with existing canals and rivers and the sea-ports, so as to render an efficient system of national transport.

During the last Presidential campaign, both political parties pledged themselves to make the transport by water a question of first prominence. Those engaged in mercantile traffic, and the large industrial companies are strongly in favour of an improvement

in the waterways of the country as being beneficial to trade by the greater facilities of transport afforded, and in the reduction of freight charges. The railway companies are credited with offering no opposition to such an expenditure of the public funds, as they have already more traffic than they can cope with satisfactorily.

The project that is now occupying most attention is the linking up of the eastern and western sides of the country by a continuous circular waterway extending over 5000 miles, serving a district covering a million and a half square miles, or an area as great as that of this country and Europe, exclusive of Russia.

Taking New York as a centre, the proposal is to connect the waterways southward to Florida and the Gulf of Mexico, running nearly parallel with the Atlantic coast, and connecting up with the existing rivers and canals, thus providing an inland route for barges and small coasting vessels. By the Gulf of Mexico there would be communication at New Orleans with the Mississippi, and thence by the Illinois River along the Drainage Canal to Chicago and Lake Michigan. Along this part of the system dredging would be required in the upper part of the Mississippi and in the Illinois River, over a distance of 850 miles, so as to give 15 ft. depth at low water. By the Great Lakes communication already exists to Buffalo, along the Erie Canal to Albany, and thence by the River Hudson to New York. By Long Island Sound, in which some dredging would be required, Cape Cod and Boston could be reached. As collateral branches the Columbia River would be made passable for barges, and afford a way for transit to the Pacific for the States of Washington, Idaho, and Oregon.

The estimated cost of carrying out this scheme is 100,000,000 pounds.

New York at the present time is spending 20,000,000*l.* in widening and deepening the Erie Canal over a length of 445 miles, so as to enable vessels of 1000 tons to pass along it.

In the State of Illinois the Government has voted 4,000,000*l.* for deepening the Illinois River and connecting Lake Michigan by means of the Drainage Canal with the Mississippi, a distance of 100 miles.

The United States Government is also spending a large amount in improving and deepening the shoal places between the Great Lakes. At Sault St. Marie an additional channel has been cut, having a depth of 26 ft. of water. Below Detroit a curved channel has been replaced by a straight cut 13 miles long, having 20 ft. depth of water, which is to be increased to 26 ft. On the Ohio River, extending from Pittsburgh to the Mississippi, a length of 1000 miles, for some time past works have been in course of construction for the improvement of the navigation, involving the making of fifty dams and locks at a cost of 12,000,000*l.* These locks have a length of 350 ft. by 45 ft. in width, with 17 ft. of water over the sills. A new and straighter channel, called the Ambrose Channel, has been dredged from the sea up to New York, giving a depth of 40 ft. at low water. This work has been in progress since 1901. For the over-sea shipping extensive works have also been carried out in the harbour, and a large pier constructed for ocean-going vessels. A canal has been made from the Hudson river, 2000 ft. long with 30 ft. depth of water, along which berths for vessels have been provided. At the city of Newark work has been commenced on a new port opening out of New York harbour; and a canal is being made 3 miles long by 700 ft. wide, in which berths for vessels are to be constructed, and a large

area of marsh land reclaimed and adapted for storage purposes.

On the Delaware River and approach to Philadelphia a 30-ft. waterway has been dredged at a cost of 200,000*l.*; and a scheme is now under consideration for a further expenditure of 150,000*l.* by the city for the purchase of the river frontage and construction of wharves. Also, for the improvement of the navigation up to Baltimore, a 35-ft. channel is being dredged 25 miles long.

At the entrance to the Mississippi from the Gulf of Mexico, the jetties constructed by Captain Eade thirty years ago have been replaced and the channel deepened at a cost of 1,200,000*l.* A large sum is also being expended in improving the ports on the Great Lakes.

For the completion of the Panama Canal, which is now being carried out by the United States Government, 30,000,000*l.* has so far been appropriated by Congress.

In Canada the project of providing a cheap and convenient mode of transit for Canadian produce through Canadian territory to Canadian ports for shipment abroad, by connecting the Great Lakes with the St. Lawrence and so with the Atlantic by what is known as the Georgian Bay scheme, has now assumed a definite shape.

During the last few years a most extraordinary development of trade has taken place at the ports situated on the Great Lakes. The freight passing through the locks at Sault St. Marie rose from 13,000,000 tons in 1894 to 51,000,000 tons in 1906. The transit of wheat rose from 35,000,000 to 84,000,000 bushels; and of iron ore from 6,500,000 to 35,500,000 tons. In the meantime the capacity of the vessels trading on the lakes has increased to 10,000 tons. The greater part of this traffic, however, passes by American waterways to the sea coast, and only about 8 per cent. reaches the St. Lawrence. It is estimated that grain can be carried from Chicago to Montreal at two-thirds the cost of transit to New York, and Montreal is 300 miles nearer to Liverpool than New York.

The Canadian Government has been giving recently its serious attention to this matter, and it is generally admitted that the carrying out of this scheme is the next great work to be undertaken after the completion of the Transcontinental Railway.

This scheme was first mooted fifty years ago, and various routes for carrying the waterway have been proposed. A report has, however, been recently presented by the Public Works Department as the result of a survey made by its officers at a cost of 110,000*l.*, and a definite scheme settled. The route proposed is from Georgian Bay along the French river and Lake Nipissing into the Mattawa and Ottawa rivers, and so into the St. Lawrence, the distance between Montreal and Georgian Bay being 440 miles. The waterway where artificial works are required is to be sufficient to carry the largest vessels trading on the lakes, which require 20 ft. of water. The cost is estimated at 20,000,000*l.*, and the time for construction ten years. There will be required eighteen dams and twenty-seven locks, which are to be 650 ft. long. There will be 28 miles of canal excavation, and more than 400 miles of dredging in the lakes and rivers. It is also proposed as part of the scheme to use the water stored for generating electric power, and it is calculated that there will be sufficient supply and fall to develop 1,000,000 horse-power.

For improving the transit up the St. Lawrence to Montreal the Canadian Government is dredging the river over a length of 62 miles, so as to give a depth of 30 ft. at low water.